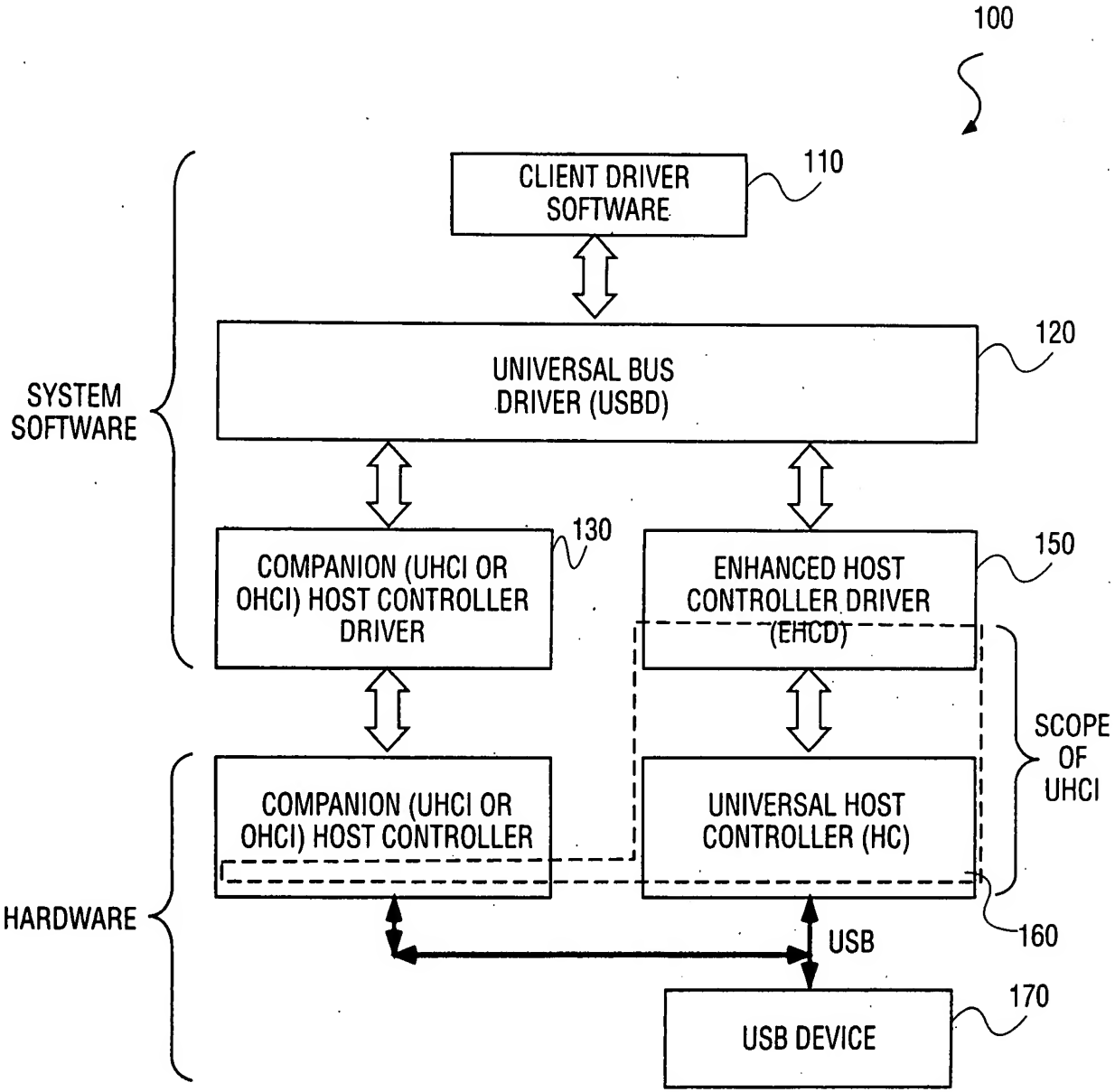
100
CLIENT DRIVER SOFTWARE
110
UNIVERSAL BUS DRIVER (USBD)
120
SYSTEM SOFTWARE
COMPANION (UHCI OR OHCI) HOST CONTROLLER DRIVER
130
ENHANCED HOST CONTROLLER DRIVER (EHCD)
150
SCOPE OF UHCI
COMPANION (UHCI OR OHCI) HOST CONTROLLER
UNIVERSAL HOST CONTROLLER (HC)
HARDWARE
160
USB
USB DEVICE
170

FIG. 1

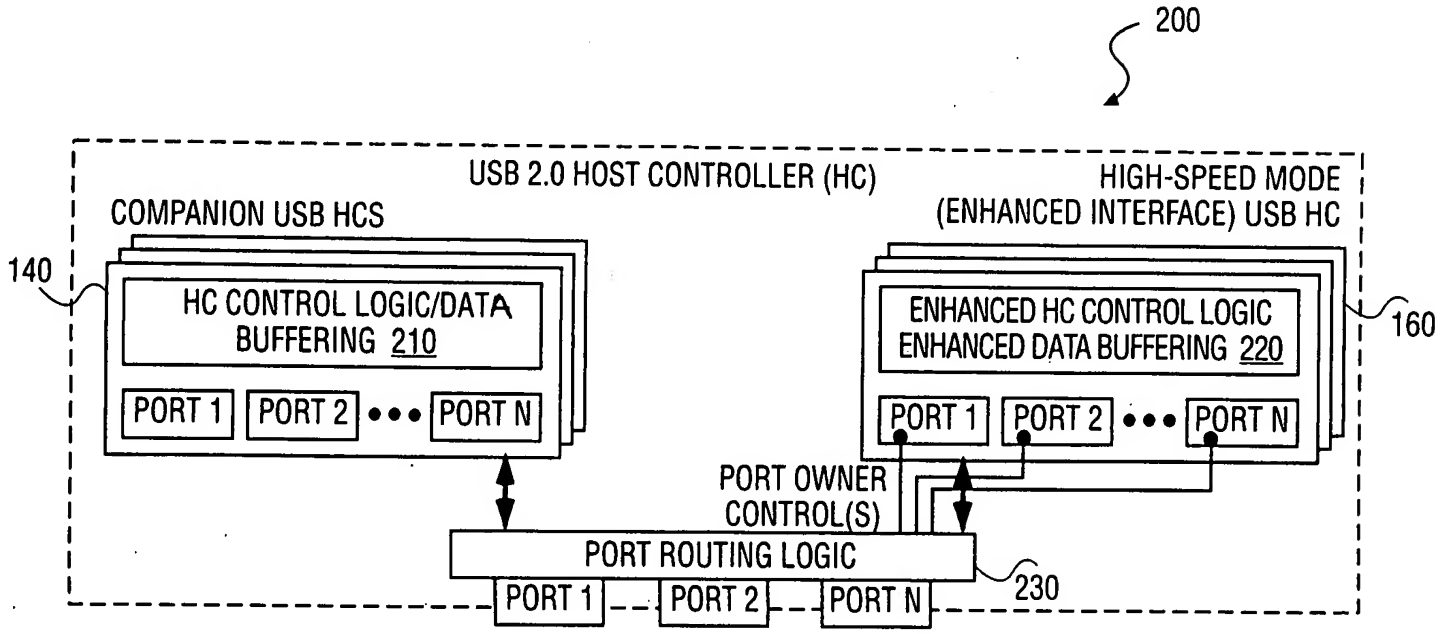
200
USB 2.0 HOST CONTROLLER (HC)
COMPANION USB HCS
140
HC CONTROL LOGIC/DATA BUFFERING 210
PORT 1
PORT 2
PORT N
HIGH-SPEED MODE (ENHANCED INTERFACE) USB HC
ENHANCED HC CONTROL LOGIC ENHANCED DATA BUFFERING 220
160
PORT OWNER CONTROL(S)
PORT ROUTING LOGIC
230
PORT 1
PORT 2
PORT N

FIG. 2

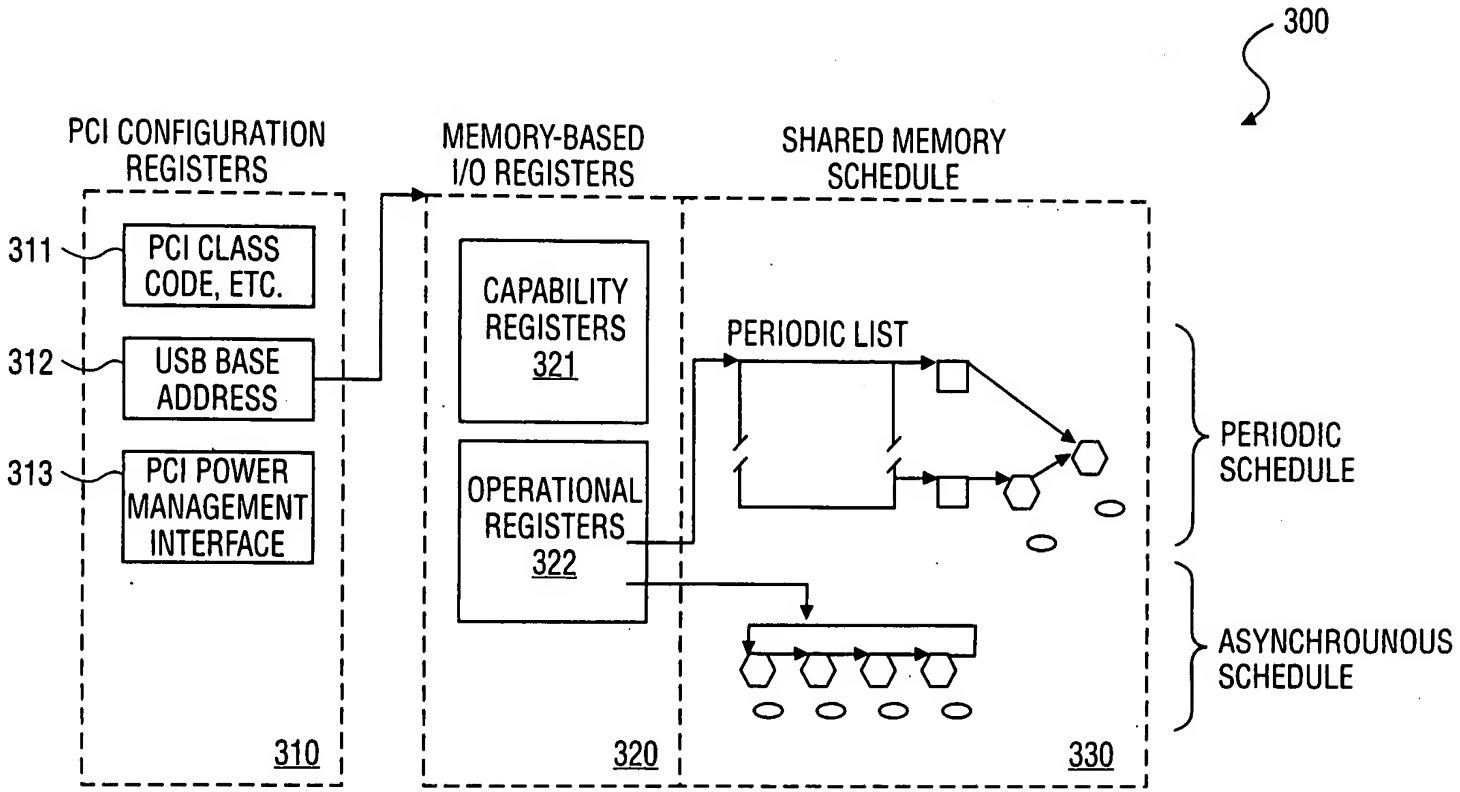
300
PCI CONFIGURATION REGISTERS
MEMORY-BASED I/O REGISTERS
SHARED MEMORY SCHEDULE
311
PCI CLASS CODE, ETC.
312
USB BASE ADDRESS
313
PCI POWER MANAGEMENT INTERFACE
CAPABILITY REGISTERS 321
OPERATIONAL REGISTERS 322
PERIODIC LIST
PERIODIC SCHEDULE
ASYNCHROUNOUS SCHEDULE
310
320
330

FIG. 3

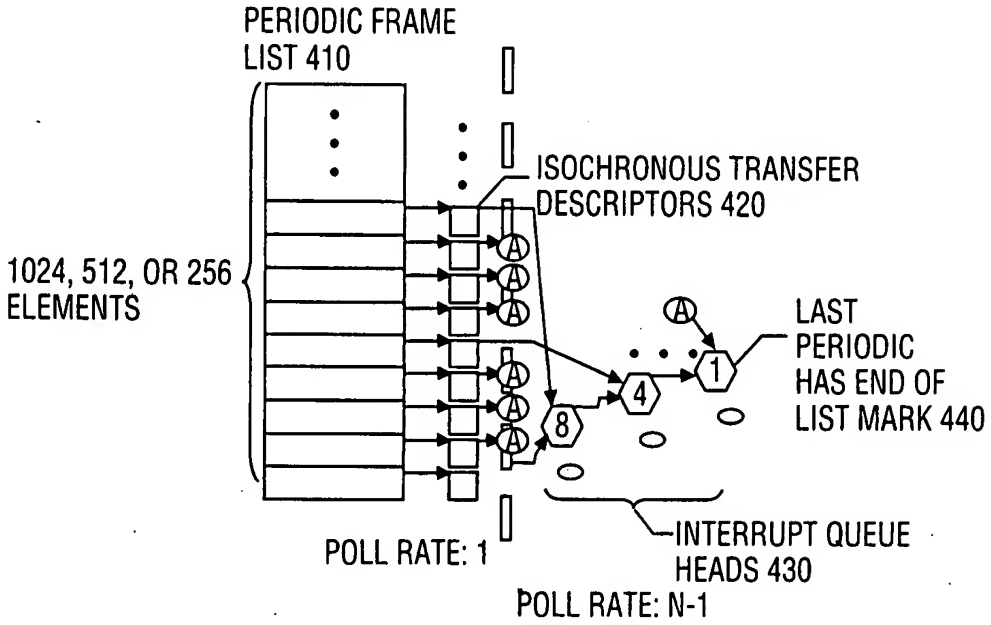
PERIODIC FRAME
LIST 410
ISOCHRONOUS TRANSFER
DESCRIPTORS 420
1024, 512, OR 256
ELEMENTS
LAST
PERIODIC
HAS END OF
LIST MARK 440
INTERRUPT QUEUE
HEADS 430
POLL RATE: 1
POLL RATE: N-1

FIG. 4

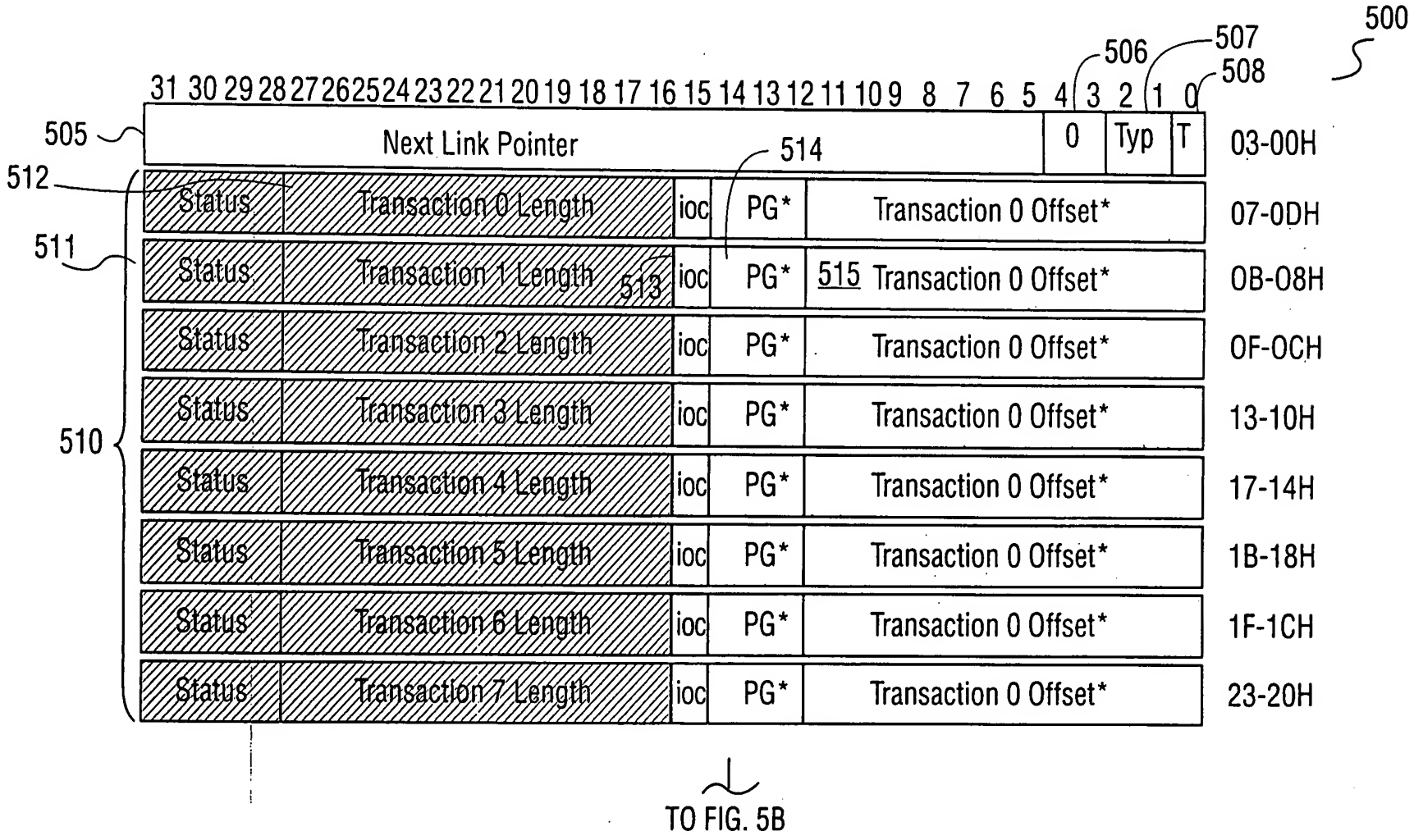

FIG. 5A

*Note: these fields may be modified by the host controller if the I/O field indicates an OUT

500

31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

FROM FIG. 5A

520

Buffer Pointer (Page 0)	EndPt	R	Device Address	27-24H
Buffer Pointer (Page 1)	I/O	Maximum Packet Size		2B-28H
Buffer Pointer (Page 2)	Reserved		Mult	2F-2CH
Buffer Pointer (Page 3)	Reserved			33-30H
Buffer Pointer (Page 4)	Reserved			37-34H
Buffer Pointer (Page 5)	Reserved			3B-38H
Buffer Pointer (Page 6)	Reserved			3F-3CH

FIG. 5B

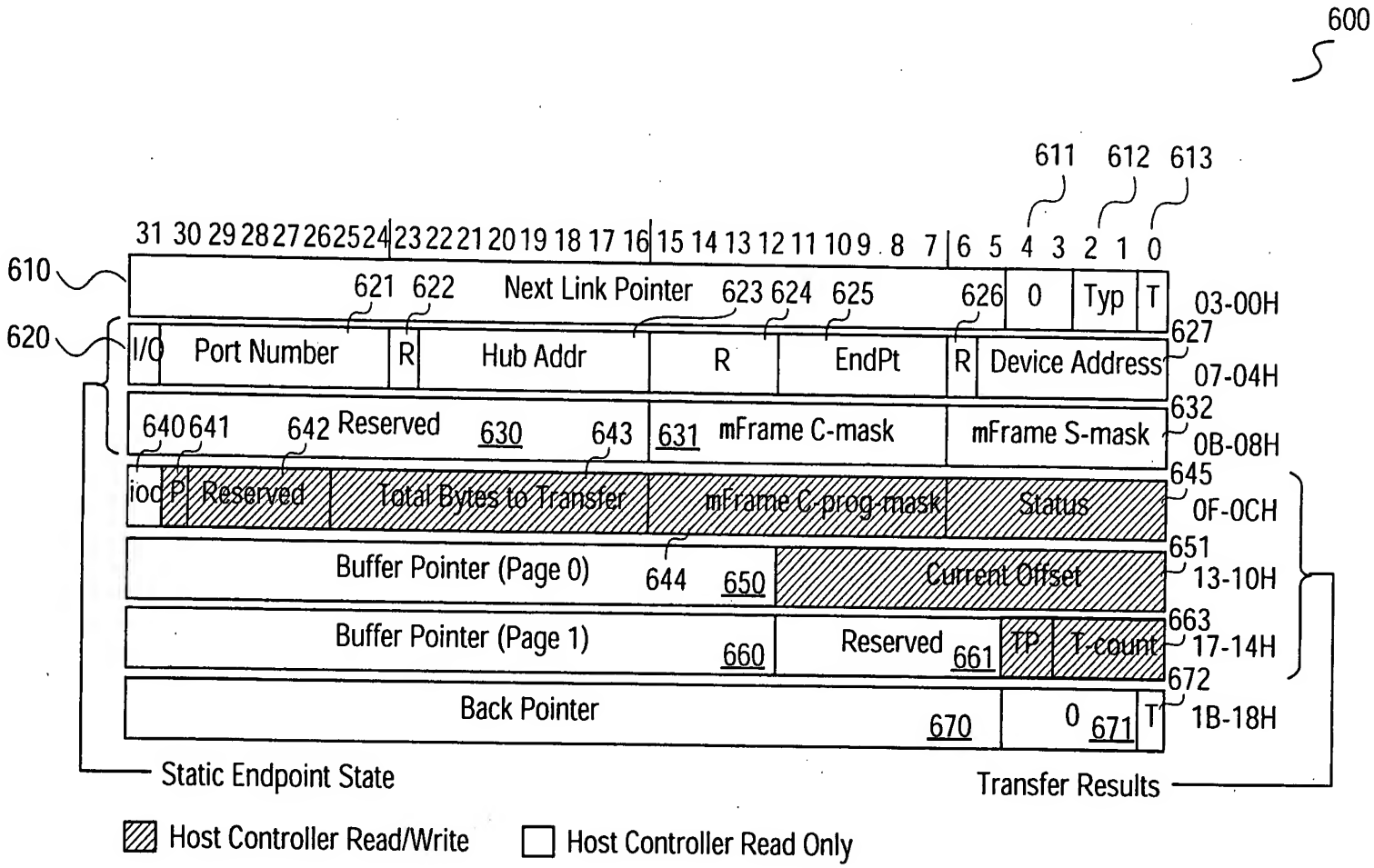
600
611
612
613
31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
610
620
621
622
623
624
625
626
627
632
640
641
642
643
644
645
650
651
660
661
663
670
671
672
Next Link Pointer
0
Typ
T
03-00H
I/O
Port Number
R
Hub Addr
R
EndPt
R
Device Address
07-04H
Reserved
630
631
mFrame C-mask
mFrame S-mask
0B-08H
ioc
P
Reserved
Total Bytes to Transfer
mFrame C-prog-mask
Status
0F-0CH
Buffer Pointer (Page 0)
Current Offset
13-10H
Buffer Pointer (Page 1)
Reserved
TP
T-count
17-14H
Back Pointer
0
T
1B-18H
Static Endpoint State
Transfer Results
Host Controller Read/Write
Host Controller Read Only

FIG. 6

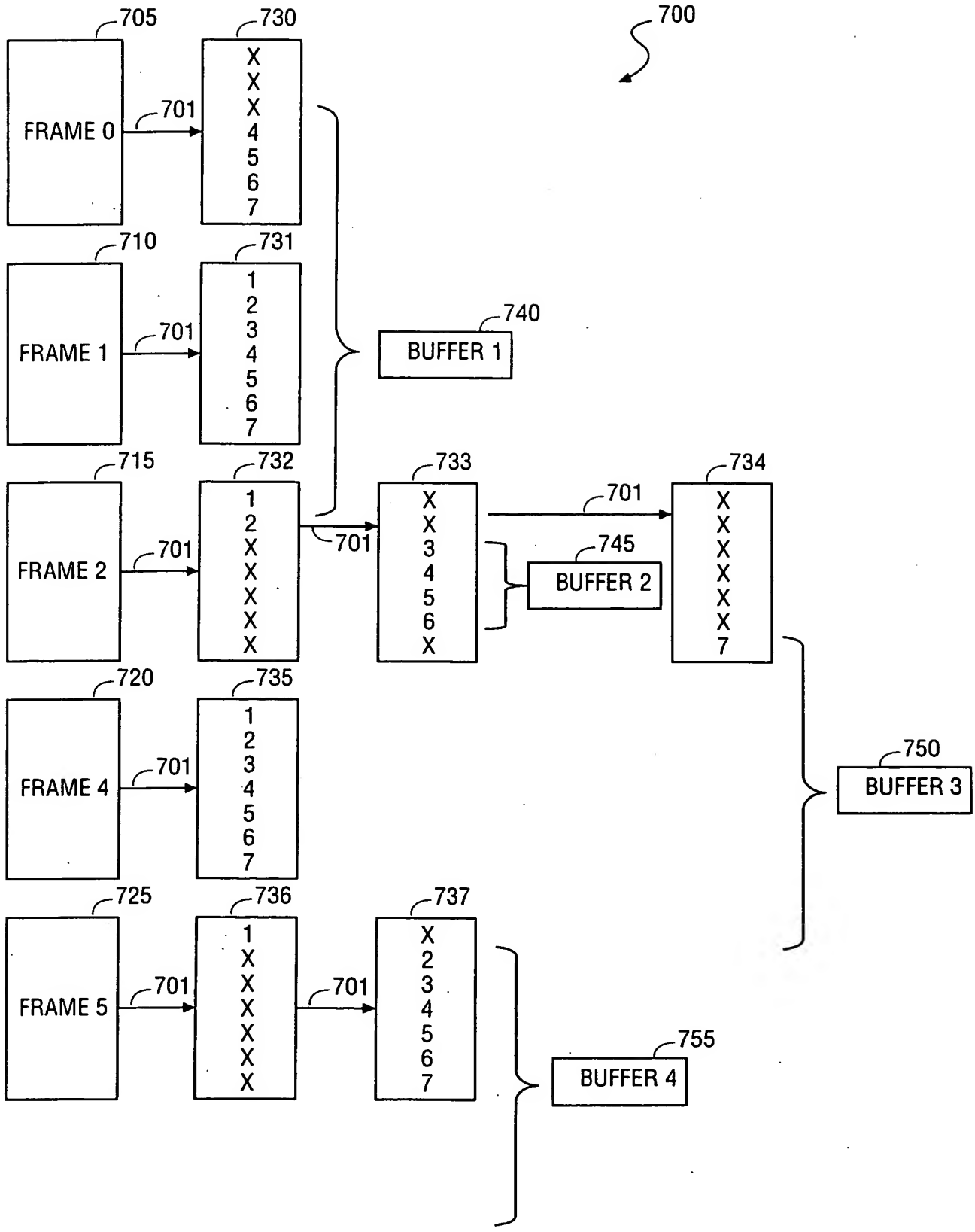
700
705
730
X
X
X
4
5
6
7
FRAME 0
701
710
731
1
2
3
4
5
6
7
FRAME 1
701
740
BUFFER 1
715
732
1
2
X
X
X
X
X
FRAME 2
701
701
733
X
X
3
4
5
6
X
701
734
X
X
X
X
X
X
7
745
BUFFER 2
720
735
1
2
3
4
5
6
7
FRAME 4
701
750
BUFFER 3
725
736
1
X
X
X
X
X
X
FRAME 5
701
701
737
X
2
3
4
5
6
7
755
BUFFER 4

FIG. 7

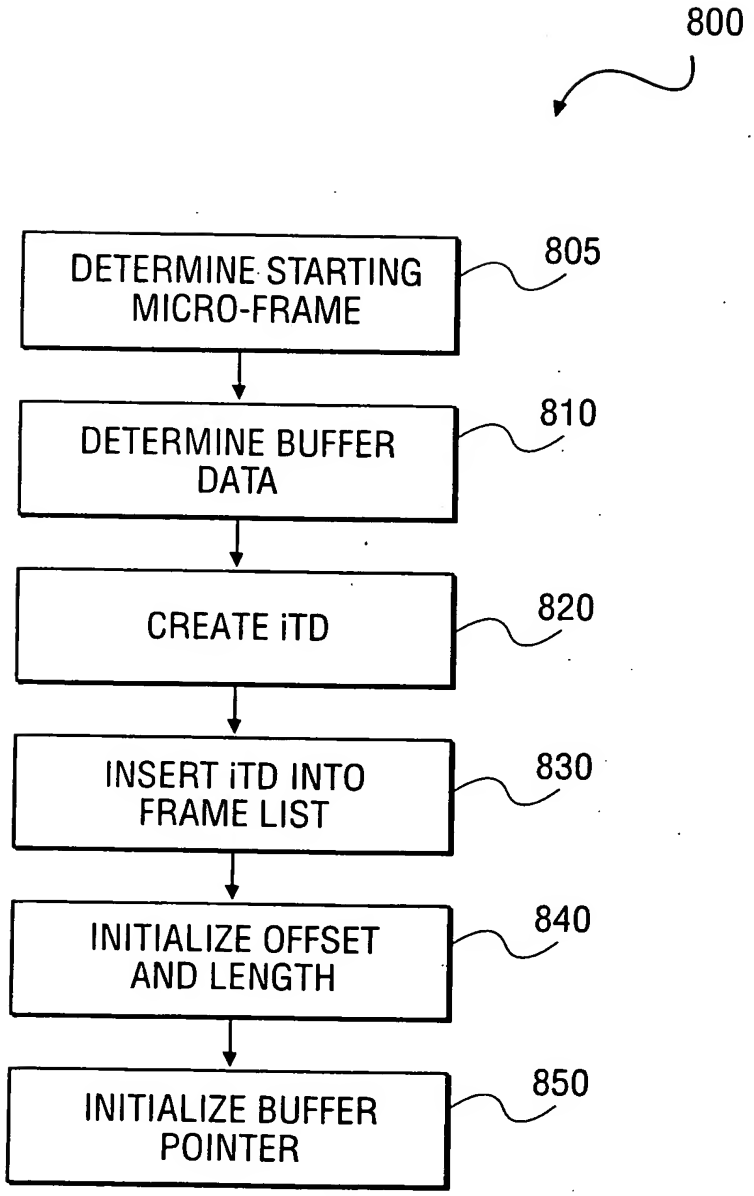
800
DETERMINE STARTING MICRO-FRAME
805
DETERMINE BUFFER DATA
810
CREATE iTD
820
INSERT iTD INTO FRAME LIST
830
INITIALIZE OFFSET AND LENGTH
840
INITIALIZE BUFFER POINTER
850

FIG. 8